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Notice of Allowability	Application No.	Applicant(s)	
	10/736,643	KNEISSL ET AL.	
	Examiner	Art Unit	
	Thomas L. Dickey	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment After Final filed 08/02/06.
2. ☒ The allowed claim(s) is/are 1,2 and 4-24.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

Claims 1,2, and 4-24 are allowed over the references of record because none of these references disclosed or can be combined to yield the claimed invention such as a III-V semiconductor laser diode, comprising a quantum well active region, an n-type carrier confinement layer, a p-type carrier confinement layer, and undoped spacer layers provided between the active region and the carrier confinement layers, wherein each of the n-type and p-type carrier confinement layers and the undoped spacer layers has an aluminum content which is about 10% to about 30% higher than an aluminum content of the quantum well active region, as recited in claim 1.

Claim 1 requires, inter alia, that each of the n-type and p-type carrier confinement layers and the undoped spacer layers have an aluminum content which is about 10% to about 30% higher than an aluminum content of the quantum well active region. It is known in the prior art how to add more aluminum to an Al-GaN compound semiconductor layer. Furthermore, the effect of adding 10-30% more aluminum is well known. Note Figure 9 of US patent No. 5006908. Adding Al tends to reduce the lattice constant and raise the band gap energy. Adding In tends to increase the lattice and decrease the band gap. Adding Ga to a 50-50 mix of AlN and InN tends to decrease both the lattice and the gap, although add-

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ing Ga to mostly InN will decrease the lattice and increase the gap, while conversely adding Ga to mostly AlN will increase the lattice and decrease the gap.

One of skill in the art thus would have known how to modify each of the n-type and p-type carrier confinement layers and the undoped spacer layers have an aluminum content which is about 10% to about 30% higher than an aluminum content of the quantum well active region of the III-V semiconductor laser diodes of any of Saito et al. 6,121,634, Matsumoto et al. ep908988a, or Seko et al.

6,597,017, in order to meet claim 1. One of skill in the art would have readily been able to predict exactly what would be the properties of a III-V semiconductor laser diode modified in this fashion. What one of skill in the art would not have known would have been why anyone would wish to increase the aluminum content of each of these at least layers at least 10%, but no more than 30%.

Recently, in *In re Scott E. Johnston*, 77 USPQ2d 1788 (Fed. Cir., January 30, 2006), the Federal Circuit reiterated its 'motivation' test to establish obviousness of a combination invention:

The Federal Circuit stated in no uncertain terms that precedent requires that to find a combination obvious there must be some teaching, suggestion, or motivation in the prior art to select the teachings of separate references and combine them to produce the claimed combination. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1385 (Fed. Cir. 2001) ("In holding an invention obvious in view of a combination of references, there must be some suggestion, motivation,

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or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention."); *In re Dance*, 160 F.3d 1339, 1343 (Fed. Cir. 1998) ("When the references are in the same field as that of the applicant's invention, knowledge thereof is presumed. However, the test of whether it would have been obvious to select specific teachings and combine them as did the applicant must still be met by identification of some suggestion, teaching, or motivation in the prior art, arising from what the prior art would have taught a person of ordinary skill in the field of the invention."); *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988) (there must be "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references"); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985) ("When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.") elements from different sources and states that they should be combined in the same way as in the invention at issue, is rarely found in the prior art. Many factors are relevant to the motivation-to-combine aspect of the obviousness inquiry, such as the field of the specific invention, the subject matter of the references, the extent to which they are in the same or related fields of technology, the nature of the advance made by the applicant, and the maturity

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and congestion of the field. Objective indicia are also relevant, see *Graham v. John Deere Co.*, 383 U.S. 1 (1966), for the commercial response to an invention is a useful control upon hindsight evaluation of obviousness. Precedent has also recognized that "[t]he suggestion or motivation to combine references does not have to be stated expressly; rather it may be shown by reference to the prior art itself, to the nature of the problem solved by the claimed invention, or to the knowledge of one of ordinary skill in the art." *Medical Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1221-22 (Fed. Cir. 2003). However the Federal Circuit, citing *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998) (obviousness requires proof "that the skilled artisan . . . would select the elements from the cited prior art references for combination in the manner claimed") explicitly stated that some "suggestion, motivation, or teaching" is required to impart objectivity to the determination of obviousness. See also MPEP § 2143.01.

Applicants have chosen to put no less than 10% but no more than 30% additional aluminum in each of the n-type and p-type carrier confinement layers, as well as the undoped spacer layers. Choosing these particular limits for these particular layers, in the eyes of one having skill in the art, would have seemed nothing more than a personal preference; an apparently capricious choice which could not have arisen from any previously available teaching, suggestion, or motivation.

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On June 26 of this year The United States Supreme Court granted certiorari in *KSR International Co. v. Teleflex Inc., et al.* to resolve the specific question, "Whether the Federal Circuit has erred in holding that a claimed invention cannot be held 'obvious', and thus unpatentable under 35 U.S.C. § 103(a), in the absence of some proven 'teaching, suggestion, or motivation' that would have led a person of ordinary skill in the art to combine the relevant prior art teachings in the manner claimed." However, in the absence of a resolution of this case the Examiner believes he is bound to follow existing law.

Although the Examiner feels bound by *In re Johnston* and the multitude of cases cited therein, the Examiner questions the wisdom of applying the "teaching, suggestion, or motivation" to the type of combination Applicants claim here. The "teaching, suggestion, or motivation" test was formulated to avoid the temptation of using hindsight to employ an applicant's disclosure as a "blueprint" for assembling an odd lot of known elements into the combination that applicant claims as his invention. *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir., 1999). However, in this case, the prior art inventors (Saito et al., Matsumoto et al., and Seko et al., or more likely, some common source from which all three obtained the "blueprint") have already assembled the known elements (a quantum well active region, an n-type carrier confinement layer, a p-type carrier confinement layer, and undoped spacer layers) into a combination. Applicants' contribution consists of modifying that combination in a known fashion to obtain a pre-

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dictable result. This result is, however, limited to a range this Examiner can find no specific reason for desiring.

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

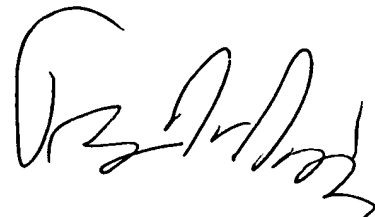
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR

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only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thomas L. Dickey
Primary Examiner
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